

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PP04-0115	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. <b>PCT/KR2004/002952</b>	International filing date (day/month/year) <b>15 NOVEMBER 2004 (15.11.2004)</b>	Priority date (day/month/year) <b>14 NOVEMBER 2003 (14.11.2003)</b>	
International Patent Classification (IPC) or national classification and IPC <b>C08K 3/26(2006.01)i</b>			
Applicant <b>LG CHEM, LTD. et al</b>			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>4</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____ containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>

Date of submission of the demand <b>24 MAY 2005 (24.05.2005)</b>	Date of completion of this report <b>28 FEBRUARY 2006 (28.02.2006)</b>
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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/002952

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on translations from the original language into the following language English, which is the language of a translation furnished for the purposes of:

international search (under Rules 12.3 and 23.1(b))  
 publication of the international application (under Rule 12.4)  
 international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

the international application as originally filed/furnished

the description:

pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_ as originally filed/furnished  
 pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the claims:

pages \_\_\_\_\_ as originally filed/furnished  
 pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_ as amended (together with any statement) under Article 19  
 pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the drawings:

pages \_\_\_\_\_ as originally filed/furnished  
 pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3.  The amendments have resulted in the cancellation of:

the description, pages \_\_\_\_\_  
 the claims, Nos. \_\_\_\_\_  
 the drawings, sheets \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages \_\_\_\_\_  
 the claims, Nos. \_\_\_\_\_  
 the drawings, sheets \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/002952

## Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	5 - 26	YES
	Claims	1 - 4	NO
Inventive step (IS)	Claims	None	YES
	Claims	1 - 26	NO
Industrial applicability (IA)	Claims	1 - 26	YES
	Claims	None	NO

## 2. Citations and explanations (Rule 70.7)

Reference is made to the following document:

D1 : US 5,214,092 A (Solvay S.A.)

The subject matter of the present invention relates to a PVC(polyvinylchloride)-PCC(precipitated calcium carbonate) nanocomposites resin composition with superior impact strengths and a method for preparing the same, the composition comprising (a) vinylchloride monomer (b) nano-sized calcium carbonate and (c) hydrophobic dispersant. Also, a polymerization initiator can be added.

Document D1, which is considered to represent the most relevant state of the art, discloses the impact resistant compositions based on vinyl chloride polymers and their use for profile extrusion, the compositions comprising : (a) graft copolymer of vinyl chloride with polybutyl acrylate (b) graft copolymer of vinyl chloride with an EVA copolymer (c) unmodified vinyl chloride copolymer (d) calcium carbonate in fatty acid coated particles of average diameter less than 1  $\mu\text{m}$ . Also, It can be added common ingredients such as heat stabilizers and the like.

## 1. Concerning claims 1-4

The claims 1-4 and D1 are the same in that both inventions relate to impact resistant compositions based on vinyl chloride polymers, comprising nano-sized calcium carbonate such as a reinforcing agent.

Therefore, the subject matter of claims 1-4 does not meet the requirement of PCT Article 33(2) and (3) because it is not novel in respect of the prior art and does not involve an inventive step.

(Continued on Supplemental Box.)

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**Supplemental Box****In case the space in any of the preceding boxes is not sufficient.****Continuation of:**

Box No. V.

**2. Concerning claims 5-26**

The claims 5-26 and D1 are the same in that both inventions relate to impact resistant compositions based on vinyl chloride polymers and a method for preparing the same.

However, both inventions are slightly different in that D1 does not specify the sorts of the dispersants, and in the method for preparing nanocomposites. So, the novelty of the subject matter claimed can be acknowledged (PCT Article 33(2)).

Here, the dispersants such as a monomer(or polymer)-type compound with phosphoric acid, can be easily interchanged by a person skilled in the art. Also, the method for preparing nanocomposite in the present invention would be obvious to an ordinary skilled person. Therefore claims 5-26 are trivial and not capable of supporting the requirements of inventive step under PCT Article 33(3).

Consequently, claims 5-26 are novel, but not inventive.

Industrial applicability of the claims 1-26 can be acknowledged (PCT Article 33(4)).